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PROCESS OF TREATING BIOTITE.

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To all whom it may concern:

Be it known that I, JAMES KEETH, a citizen of the United States, residing at Spokane, in Spokane County, and the State of Washington, have invented certain new and useful Improvements in a Process of Treating Biotite, of which the following is a specification.

My present invention relates to an improved process of treating biotite or "black mica" one of the members of the group of mica minerals, characterized as a silicate of aluminum and iron with magnesium and potassium forming component parts thereof.

By experiment, careful study, analysis, and practical application of the steps of the following process, I have discovered and produced a material of especially high commercial value for purposes of electric and heat insulation, and because of its heat resisting qualities and lubrication may be used in packings for journals, etc., and in addition is readily adapted for decorative purposes when utilized with fancy paints, coating ornamental tiles, and also for coating wall papers.

The process as hereinafter described contemplates the hydration and calcining of the raw material or ore as brought from the mine, and I have herein set forth one complete example of the physical embodiment of my invention which carries out the steps of my process according to the best mode I have thus far devised for the practical application of the principles of my invention. The resulting finished product is well adapted for the uses above indicated and may be applied and employed in many and various other relations than those specified.

In mining the raw material, the mineral is found deposited in sheets or layers forming "books," the layers possessing a smooth somewhat greasy appearance, of a dark brownish color, and possessing approximately the specific gravity of ordinary rock. The books of biotite as thus mined are in the form of lumps of mineral of various sizes and constituted by laminations or closely adhering sheets or leaves, and these lumps or books assume various shapes or forms, some thin and flat with irregular outlines, and others of greater thickness and more regular in outline, but all possessing the characteristic of laminated adhering sheets or leaves.

The raw material thus mined in subjected to the process of dehydrating and burning under heat ranging through various degrees depending upon the requirements of the resulting product.

As an exemplification of the process of treating the mineral, I take the books of biotite as above described and place them in a heating furnace, suitable equipped for the purpose, the quantity of raw material depending upon the size of the furnace. The intensity of the heat to which the material is thus subjected may be varied for producing different characteristics in the resulting product. I have found that by subjecting the material to approximately a heat of 350 degrees F., the dehydrated and burnt material is increased or expanded in size, i. e., the books or lumps of material retain their original individual body formations as integral elements, but the size is increased and the form or shape may vary from the original. The product thus attained retains its laminated or sheet formation, its specific gravity is decreased and its color is changed to a shiny light brown or bronze shade.

By increasing the temperature of the heat in the furnace to say seven hundred degrees F. and permitting the application of this heat to approximately a period of seven minutes time, the size of the product is expanded and closely approaches ten times the original size. Thus for example I take a mass of lumps in quantity and size approximating a cubic foot and weighing about 100 lbs. After subjecting these lumps to a temperature of 700 degrees F. for a period of about seven minutes, the cubical size of the mass has expanded to ten times the original size, and of course each individual lump has been expanded approximately ten times its original size. The specific gravity of the material has been greatly reduced, and the resulting mass is made up of lofty constituents still retaining their laminated form and although of increased size yet maintaining somewhat a resemblance to the original shape. The individual pieces may be compared in weight to a similar size piece of cork. The color has been further changed from that resulting when the material is subjected to a less intense heat as above described, and now possesses a gold bronze shade or hue of much lighter appearance than the material when subjected to a less heat. The ex-